



Dual Channel Wireless Transceiver
 Model # 6215
 User Manual
 March, 2010

Introduction

American Mine Research’s Dual Channel Wireless Transceiver (MN-6215) will bring additional features to the existing Mine Net tracking and communication system. The MN-6215 will act as a wireless repeater and/or a wireless reader for Mine Net Messengers and Smart Tags which will greatly expand the versatility of the communication system. This unit will have multiple configurations to help solve a variety of mine tracking and communication difficulties.

Installation

Device Configuration:

Set the device configuration for GoPad, LilyPad or MeshPad using the configuration switches (see table 1). For example: to select the GoPad configuration, set SW1E, SW1D, SW1B, and SW1G to the off position. SW1F and SW1H will control the receiver squelch range for the Linx radio transceivers and should be set to the off position. The fine adjustment squelch control for the Tag channel (potentiometer R7) should be set to minimum squelch (counterclockwise until it clicks) . The fine adjustment squelch control for the Messenger channel (potentiometer R4) should be set to maximum squelch (clockwise until it clicks) to match the rest of the system component settings. The squelch controls should only be changed if necessary. Set the address select switches using BS2 & BS1 (BS2 = MSD (Tens), BS1 = LSD (Ones)) to a unique address between 00 and 99. Set dip switch SW1A (#1) to the on position to add 100 to the address set by the other address switches. This gives a total of 200 different addresses available for each device configuration (Config 1 and Config 2 are also part of the address).

<u>Function</u>	<u>Schematic Label</u>	<u>Physical Switch Number</u>		<u>GoPad</u>	<u>LilyPad</u>	<u>MeshPad</u>	<u>TBD</u>
CONFIG 1	SW1E	#5		OFF	ON	OFF	ON
CONFIG 2	SW1D	#4		OFF	OFF	ON	ON
ADR 100	SW1A	#1		ADDRESS	ADDRESS	ADDRESS	ADDRESS
TAG ONLY	SW1C	#3		ON for TAG ONLY applications			
U1TX	SW1B	#2		OFF	OFF	OFF	TBD
U1RX	SW1G	#7		OFF	OFF	OFF	TBD
HIGH SQUELCH (418 MHz)	SW1F	#6		TBD	TBD	TBD	TBD
HIGH SQUELCH (315 MHz)	SW1H	#8		TBD	TBD	TBD	TBD

Table 1. Switch Settings for the Dual Channel Wireless Transceiver



LED Indications:

There are several different patterns that the LED will flash, each indicating something different.

1. During initialization (after cycling power) the LED will flash red on and off for ~1 second, then flash green on and off for ~1 second. This gives visual confirmation that both colors are working. At all other times (when a Tag is near) the LED flash pattern will be one color on and off for ¼ second, then off for ¾ second then repeating the pattern for the next color and so on.
2. During Range Detection mode (~10 minutes following initialization)
 - a. A green – green pattern indicates that the Pad is in range of another Pad
 - b. A green – red pattern indicates that the Pad is not in range of another Pad
 - c. A solid red LED lasting ~10 seconds indicates the end of Range Detection mode
3. Low Battery condition is indicated by a persistent red – red flashing pattern (no green at all). Mine Net also shows the battery levels of the Pads. Note: Low battery indication takes precedence over Range Detection mode and can be observed at any time after initialization (but only if a Tag is near).

Pad Deployment:

Switch on the first unit using the toggle switch located inside the cover, between the battery covers. Observe the initialization pattern to make sure both colors are working.

Note: for optimal performance, place pads with antenna(s) running parallel to Reader antennas (typically parallel to crosscuts).

Mesh & Lily Pad Deployment:

After the unit initializes, it will go into a range finding mode for ~10 minutes. During this time the LED will flash green one second and red the next second if it does not “hear” another Pad. Place the first unit within range of the nearest Reader antenna(s) (~400’ but will vary with conditions and line of sight obstacles such as power centers). Tip – it is easiest to put the first Pad close (~200’) since the Tag Reader does not send any range information and the first Pad will flash green – red. Switch on the second Pad and place it in the desired location. Verify the LED is flashing in a green – green pattern. If it is flashing a green – red pattern then it is not “hearing” another Pad, and will have to be relocated within range or evaluated for poor placement. Continue to deploy the Pads in this way until the desired coverage is achieved.

Go Pad Deployment:

Verify the LED is flashing a green – green pattern (only flashes when a Tag is near) and mount to vehicle or equipment with antenna(s) running parallel with crosscuts.

Note: An external (non-IS) power source (i.e. vehicle lighting) can be used to power the device, however, external power and alkaline batteries may not be connected at the same time.

Maintenance

The only major internal maintenance item for the MN-6215 would be to change the disposable C cell batteries at a recommended interval (or as indicated by the battery level shown in Mine Net) which is referenced in Appendix A of this document. When battery level is low the LED will flash a red – red pattern persistently (but only when a tag is near). Batteries may be changed in a permissible area which significantly reduces the maintenance burden.



Construction

The MN-6215 is self contained in a dust proof, polyester container with 1 to 2 (configuration dependant) bulkhead RP-SMA connectors for external quarter wave monopole whip antennas. One bi-color bulkhead LED indicator is visible on the top/bottom (depends on mounting) of the unit, one green and one red. External brackets allow for versatile mounting of the unit. Battery enclosures sealed inside the hinged lid allow for ease of battery change out.

Mounting

The MN-6215 will be versatile in regards to mounting locations. The IS MN-6215 is mounted free of cabling and operates on disposable alkaline batteries. It may be hung from roof bolts or mounted to vehicles as needed. Non-IS versions mounted to man trips and other non-IS equipment may be powered externally by readily available non-IS power sources (such as lamp power).



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Appendix A
Specifications and Data Sheet

Physical Parameters:

Size: 6.125" W. x 4.125" H. x 3.875" D.
Weight: 3 pounds
Body Construction: 0.125" thick Polyester

Electrical Parameters:

Battery: Four disposable alkaline C cell batteries
Required Replacement Battery: ENERGIZER EN93
Expected Maximum Battery Life: 25 days

RF Transceiver:

Linx Technologies RF Product #: TRM-315-LT
Frequency (OOK Modulated): 315 MHz +/- 50 KHz
Peak Radiated Output Power¹: +11dBm / 13mW
Average Radiated Output Power²: -1.0dBm / 0.78mW
Radiated Output Power³: <60dBm / <1nW
Range: TBD

RF Transceiver:

Linx Technologies RF Product #: TRM-418-LT
Frequency (OOK Modulated): 418 MHz +/- 50 KHz
Peak Radiated Output Power¹: +11dBm / 13mW
Average Radiated Output Power²: +7.1dBm / 5.2mW
Radiated Output Power³: <60dBm / <1nW
Range: TBD

1: During TX / High
2: During Active Period
3: During Sleep / Low

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